AMENDMENTS TO THE CLAIMS

1. **(Currently Amended)** An open-pored biocompatible surface layer for an implant, which layer is arranged on a virgin surface of the implant, comprising:

an open-pored surface layer comprising a biocompatible metal with particles having a particle size in a range of approximately 50 μm to 800 μm, with a thickness in a range selected from the group consisting of the range from 0.1 mm to 2.5 mm inclusive, the range from 0.3 mm to 1.9 mm inclusive, and the range from 0.5 mm to 1.5 mm inclusive, the open-pored surface layer further comprising a shallow roughening in the sub-micrometer range;

the porosity of the open-pored surface layer is in a range selected from the group consisting of the range from 20% to 85% inclusive, the range from 30% to 70% inclusive, and the range from 35% to 65% inclusive.

2. **(Previously presented)** The surface layer according to claim 1, wherein

the open-pored surface layer has pits or etching pits, having a diameter in a range selected from the group consisting of the range from 0.1 μm to 2.5 μm inclusive, the range from 0.5 μm to 1.9 μm inclusive, and the range from 0.8 μm to 1.5 μm inclusive.

3. **(Canceled).**

4. **(Previously Presented)** The surface layer according to claim 1, further comprising particles arranged on the implant surface, said particles selected from the group consisting of biocompatible particles, titanium dioxide biocompatible particles, and calcium phosphate biocompatible particles.

5. **(Previously presented)** The surface layer according to claim 4, wherein the biocompatible particles have a particle size in a range selected from the group consisting of the range from 0.01 μm to 5 μm inclusive, the range from 0.1 μm and 3 μm inclusive, and the range from 0.2 μm to 1 μm inclusive.

6. **(Previously presented)** The surface layer according to claim 1, wherein the open-pored surface layer consists substantially of a material selected from the group consisting of titanium, zirconium, niobium or tantalum.

7. **(Previously presented)** The surface layer according to claim 1, wherein the open-pored surface layer is sintered.

8. **(Currently Amended)** A method of producing an implant selected from the group consisting of an open-pored coated implant, and a joint replacement implant, comprising:

applying at least one layer of a biocompatible metal or an alloy thereof to a virgin surface of the implant to produce an implant surface comprising an open-pored structure with a porosity in a range of between about 20% and 85%; and

producing a surface micro-structure on the open-pored structure~~implant surface~~.

9. **(Previously presented)** The method according to claim 8, wherein the biocompatible metal is applied by means of a vacuum plasma spraying method.

10. **(Previously presented)** The method according to claim 8, wherein the biocompatible metal is applied by a technique selected from the group consisting of brushing, spreading, spraying, and a like application technique.

11. **(Previously presented)** The method according to claim 8 wherein the at least one layer applied to the virgin surface of the implant is sintered.

12. **(Previously Presented)** The method according to claim 11, wherein the at least one layer comprises a material selected from the group consisting of binders, sintering adjuvants, and binders and sintering adjuvants.

13. **(Previously Presented)** The method according to claim 12, wherein the sintering adjuvant comprises a sintering adjuvant metal which, together with the biocompatible metal or alloy thereof, forms a eutectic selected from the group consisting of low-melting eutectic, silicon, cobalt, and a eutectic in elemental powder form.

14. **(Previously presented)** The method according to claim 11 wherein sintering is carried out *in vacuo*.

15. **(Previously presented)** The method according to claim 11 wherein sintering comprises a phase selected from the group consisting of a debindering phase, a dehydrogenation phase, and a debindering and dehydrogenation phase.

16. **(Previously presented)** The method according to 11 wherein a sintering temperature in a range selected from the group consisting of the range from 800°C to 1500°C inclusive, the range from 950°C to 1400°C inclusive, and the range from 1000°C to 1350°C inclusive is used.

17. **(Previously presented)** The method according to claim 8 wherein the biocompatible metal is used in a form selected from the group consisting of powder form and an angular powder.

18. **(Previously presented)** The method according to claim 8 wherein a layer thickness of the open-pored surface layer in a range selected from the group consisting of the range from 0.1 mm to 2.5 mm inclusive, the range from 0.3 mm to 1.9 mm inclusive, and the range from 0.5 mm to 1.5 mm is produced.

19. **(Previously presented)** The method according to claim 8 wherein the biocompatible metal applied to the virgin surface of the implant has a particle size in a range selected from the group consisting of the range from 50 μm to 800 μm inclusive, the range from 100 μm to 650 μm inclusive, and the range from 200 μm to 550 μm inclusive.

20. **(Previously presented)** The method according to claim 8 wherein the biocompatible metal is selected from the group consisting of titanium, zirconium, niobium, and tantalum.

21. **(Previously presented)** The method according to claim 8, wherein the biocompatible metal is used in the form of a metal hydride powder.

22. **(Previously Presented)** The method according to claim 8, wherein the surface micro-structure is produced by etching of the implant surface by means of a technique selected from the group consisting of acid (bath) etching, plasma etching, oxygen plasma etching, acid (bath) etching and plasma etching, and acid (bath) etching and oxygen plasma etching.

23. **(Currently Amended)** The method according to claim 8, wherein the surface micro-structure is created by application of fine biocompatible particles having[[e]] a particle size in a range selected from the group consisting of the range from 0.01 μm to 5 μm inclusive, the range from 0.1 μm to 3 μm inclusive, and the range from 0.2 μm to 1 μm inclusive.

24. **(Currently Amended)** The method according to claim 8, wherein the surface micro-structure is created by application of fine biocompatible particles [[are]] applied by a sol-gel method using a binder selected from the group consisting of a binder and a silicate-based binder.

25. **(Previously Presented)** The method according to claim 32, wherein the fine biocompatible particles comprise a material selected from the group consisting of titanium dioxide, calcium phosphate, and another biocompatible material.

26. **(Previously presented)** An implant having a surface layer according to claim 1.

27. **(Previously presented)** Use of a surface layer according to claim 1 for an implant selected from the group consisting of femoral stems, a socket for a hip joint, a femoral component for a knee joint replacement, a tibial component for a knee joint replacement, a component for a shoulder joint replacement, a component for an elbow joint replacement, a component for a toe joint replacement, a component for a finger joint replacement, a component for the fusion of vertebral bodies of the lumbar spine, a component for an intervertebral disc replacement, a transgingival implant systems, an orthodontic implant system, and a tooth (replacement) implant.

28. **(Previously presented)** The implant according to claim 26, wherein the implant is a joint replacement implant.

29. **(Previously Presented)** The method according to claim 8, wherein the porosity is in a range of between about 30% to 70% inclusive.

30. **(Previously Presented)** The method according to claim 29, wherein the porosity is in a range of between about 35% to 65% inclusive.

31. **(Previously Presented)** The method according to claim 8, wherein the surface micro-structure on the implant surface is produced by etching of the implant surface.

32. **(Previously Presented)** The method according to claim 8, wherein the surface micro-structure on the implant surface is produced by application of fine biocompatible particles to the implant surface.

33. **(Currently Amended)** A method of producing an open-pored coated implant, comprising:

applying at least one layer of a biocompatible metal or an alloy thereof, comprising particles having a particle size in a range of approximately 50 μm to 800 μm, to a virgin surface of the implant to produce an open-pored implant surface;

producing a surface micro-structure on the open-pored implant surface;

wherein at least one of the open-pored implant surface and the surface micro-structure is produced by a vacuum plasma spraying method.

34. **(Previously Presented)** The method according to claim 33, wherein the vacuum plasma spraying method applies fine biocompatible particles and is adjusted so that the fine biocompatible particles are not completely compacted upon impact.

35. **(Previously Presented)** The method according to claim 33, wherein the vacuum plasma spraying method is adjusted so that an open-pored structure of the implant surface is generally maintained.

36. **(Currently Amended)** The method according to claim 33, wherein the surface micro-structure comprises a biocompatible metal applied as ~~biocompatible~~ particles having[[e]] a particle size in a range selected from the group consisting of the range from 0.01 μm to 5 μm inclusive, the range from 0.1 μm and 3 μm inclusive, and the range from 0.2 μm to 1 μm inclusive.

37. **(Currently Amended)** An open-pored coated implant, comprising:

an open-pored implant surface comprising at least one layer of a biocompatible metal or an alloy thereof comprising particles with a particle size in the range from approximately 50 μm to 800 μm applied to a virgin surface of an implant, the porosity of the open-pored surface being in a range selected from the group consisting of the range from 20% to 85% inclusive, the range from 30% to 70% inclusive, and the range from 35% to 65% inclusive; and

a surface micro-structure applied to the open-pored implant surface, the micro-structure comprising pits having a diameter in a range selected from the group consisting of the range from 0.01 μm to 5 μm inclusive, the range from 0.1 μm and 3 μm inclusive, and the range from 0.2 μm to 1 μm inclusive,

wherein at least one of the open-pored implant surface and the surface micro-structure are applied to the implant via a vacuum plasma spraying process.

38. **(Previously Presented)** The open-pored coated implant of claim 37, further comprising particles selected from the group consisting of biocompatible particles, titanium dioxide biocompatible particles and calcium phosphate biocompatible particles.

39. **(Previously Presented)** The open-pored coated implant of claim 38, wherein the particles have a particle size in a range selected from the group consisting of the range from 0.01 μm to 5 μm inclusive, the range from 0.1 μm and 3 μm inclusive, and the range from 0.2 μm to 1 μm inclusive.

40. **(Previously Presented)** The open-pored coated implant of claim 37, wherein the biocompatible metal consists substantially of a material selected from the group consisting of titanium, zirconium, niobium or tantalum.

41. **(New)** The surface layer of Claim 1, wherein the particles define pores having an average diameter of 300 μm.

42. **(New)** The surface layer of Claim 8, wherein pores of the open-pored structure have an average diameter of 300 μm.

43. **(New)** The surface layer of Claim 33, wherein the particles define pores having an average diameter of 300 μm.

44. **(New)** The surface layer of Claim 37, wherein the particles define pores having an average diameter of 300 μm.